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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,059	11/13/2001	Achim K. Heibel	SP00-383A	3896

22928 7590 07/18/2003

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SP-TI-3-1  
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EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 07/18/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/008,059

Applicant(s)

HEIBEL ET AL

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-19 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-9, drawn to a structured catalyst, classified in class 422, subclass 222.
  - II. Claims 10-19, drawn to a method for carrying out a liquid/solid reaction or gas/liquid/solid reaction or hydro-treating reaction or gas-liquid mass-transfer process, classified in class 585, subclass 250.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process, such as a method for carrying out a gas/solid phase reaction; i.e., the purification of a combustion process exhaust gas.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, their recognized divergent subject matter, and the search required for Group I not required for Group II restriction for examination purposes as indicated is proper.

2. During a telephone conversation with Kees van der Sterre on 6/23/2003 a provisional election was made with traverse to prosecute Group II. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Specification***

4. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

#### ***Drawings***

5. The drawings are objected to because the labeling of "Fig. 1" should be changed to -- Fig. 1a -- or -- Fig. 1b -- for the separate illustrations, as set forth on page 4, lines 21-25. In addition, Fig. 1a should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 11, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

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applicant regards as the invention.

Regarding claim 11, it is unclear as to the process limitation applicants are attempting to recite by, "wherein said reaction comprises a liquid/catalyst contacting and reaction."

Regarding claim 15, it is unclear as to where the limitation of, "said reaction is conducted under conditions of liquid linear velocity of between approximately 0.01 and 100 cm/s" is located in the specification and drawings.

Regarding claim 16, it is unclear as to where the limitation of, "said feed has a gas/liquid volume ratio of between approximately 0 and 1000" is located in the specification and drawings.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 10-14 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hoelderich et al. (US 4,859,642).

Regarding claims 10-12 and 18 Hoelderich et al. disclose a method for carrying out a liquid/solid reaction or gas/liquid/solid reaction or a gas-liquid mass-transfer process, comprising the step of conveying a liquid or gas/liquid feed stream through a solid catalyst of honeycomb configuration comprising a plurality of parallel channels bounded by catalytically active walls traversing the catalyst from an inlet end to an outlet end thereof, which reads on...

"The present invention relates to a fixed-bed catalyst structure obtained using honeycomb elements, for highly exothermic and endothermic chemical reactions... both in the liquid phase and in the gas phase," (column 1, lines 20-36), and "honeycombs consisting

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completely of catalytic material, or honeycomb carriers impregnated with the active component,” (column 1, lines 38-41).

wherein the cross-sectional shape of the channels is free of angled corners, and wherein the channel cross-section is *inherently* free of curvatures having curvature radii below 10% of the average channel diameter (i.e., in the instance of a “circular” cross section), which reads on...

“The honeycombs produced and installed can be of various shapes. The cross-section may be circular, oval or polygonal,” (column 2, lines 15-25).

Regarding claims 13, 14 and 17, Hoelderich et al. further disclose said channels may be utilized for conducting gas/liquid/catalyst hydrotreating or hydrogenation, which reads on...

“The novel alternative arrangement... is particularly useful in the case of highly exothermic or endothermic organic reactions and is advantageously used in carrying out dehydrocyanizations, dehydrogenations, dehydrations, hydrogenations, elimination of alcohols and elimination of formamide,” (column 1, lines 42-48).

Regarding claim 19, Hoelderich et al. further disclose prior art use of the solid catalyst of honeycomb configuration, as disclosed above, for the claimed processes (column 1, lines 1-11).

Instant claims 10-14 and 17-19 read on the method of Hoelderich et al.

8. Claims 10-12 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dettling et al. (US 4,335,023).

Regarding claims 10-12 and 18, Dettling et al. disclose a method for carrying out a liquid/solid reaction or gas/liquid/solid reaction or a gas-liquid mass-transfer process, comprising the step of conveying a liquid or gas/liquid feed stream (“... effective in treating gases (or liquids) flowed through the flow channels,” column 20, lines 66-49) through a solid catalyst of honeycomb configuration comprising a plurality of parallel channels bounded by catalytically active walls traversing the catalyst from an inlet end to an outlet end thereof, wherein the cross-

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sectional shape of the channels is free of angles corners and *inherently* free of curvatures having curvature radii below 10% of the average channel diameter (FIG. 1, 1A-1C; column 3, lines 43-66; column 6, line 15 to column 7, line 52). Also, note the discussion of prior art in the "Background of the Invention" (column 2, line 21 to column 3, line 31).

Instant claims 10-12 and 18 read on the method of Dettling et al.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoelderich et al. (US 4,859,642).

Regarding claim 15, Hoelderich et al. further disclose that the internal width of the honeycomb structure channels may lie within 0.5 to 20 mm (column 2, lines 32-35), and cite an

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example of a fluid flow rate of approximately 30 l/hour (column 3, line 34 to column 4, line 3).

Upon calculation of a linear velocity, the method of Hoelderich et al. meets the claim of, “a liquid linear velocity of between approximately 0.01 and 100 cm/s.” Furthermore, the specific liquid linear velocity is not considered to confer patentability to the claim since the precise velocity would have been considered a result effective variable by one having ordinary skill in the art. Also, it is noted that according to the present specification, the claimed velocity, is at best, a preferred limitation. As such, without more, the claimed velocity cannot be considered “critical”. Accordingly, one having ordinary skill in the art would have routinely optimized the liquid feed rate in the system to obtain the desired flow characteristics or conversion rates, for example, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 16, Hoelderich et al. disclose the reaction may be conducted using both gas and liquid phase reactants, but is silent as to a gas/liquid volume ratio of between approximately 0 and 1000. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select and appropriate gas/liquid volume ratio for the method of Hoelderich et al., depending on the intended use of the method. Furthermore, the specific gas/liquid volume ratio is not considered to confer patentability to the claim since the precise percentage would have been considered a result effective variable by one having ordinary skill in the art. Also, it is noted that according to the present specification, the claimed ratio, is at best, a preferred limitation. As such, without more, the claimed ratio cannot be considered “critical”. Accordingly, one having ordinary skill in the art would have routinely optimized the



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amount of gas or liquid supplied to the system to obtain the desired fluid flow characteristics, for example, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- An English translation for reference DE 42 43 424 is provided with the Office Action. The reference, which was cited in the International Search Report, illustrates a method of conducting a liquid and/or gas phase reaction utilizing catalytic honeycomb elements.
- Reference, WO 02/051532, which was cited in the International Search Report but published after the application priority date, illustrates a method of conducting a liquid and/or gas phase reaction utilizing catalytic honeycomb elements, wherein the specific gas-to-liquid volume ratio is varied in order to maintain desired flow characteristics.

\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung  
July 13, 2003

  
**HIEN TRAN**  
**PRIMARY EXAMINER**